THE A-Z OF CO-DESIGN

A brief introduction to participatory design

Foreword

"The participation of end users, and the invaluable contribution this makes to design outputs, can often be significantly underestimated. To capture the wealth of expertise, resources and additional sources of information for successful participation in this simple and highly attractive format is nothing short of inspirational. We feel sure this engaging chart will encourage many to dip in and discover methods and techniques they had never considered.

Participation with all stakeholders, including the important end users, is essential if we are to evolve to a truly inclusive and just society. The A-Z allows readers to easily digest a spectrum of ways in which any designer can do this, from familiar methodologies such as walkalongs, to new techniques such as PhotoVoice.

It will no doubt provoke interest and discussion and draw readers back to it time and time again. Once the CAE team started dipping into the content, we had to go back for more!
A tool like this is a catalyst to fresh thinking, encouraging us all to be innovative in how we develop designs with invaluable user input along the way - involving, sharing and feeding back and forth thoughts and ideas - it really places the right people at the heart of the process.

The Centre for Accessible Environments truly welcomes this engaging tool which will help us all to use participatory design as the norm. We hope to see it adorning walls everywhere!"

Jean Hewitt, Director
Centre for Accessible Environments

cae Centre for Accessible Environments

MOBILITY MOOD PLACE

Introducing the A-Z of Co-Design

Co-design, or participatory design, is about the meaningful involvement of end users in the design process. By taking account of a wider range of perspectives and experiences, we can design more inclusive - more innovative - solutions, products and services that are better suited to users' needs.

Presented in bite-sized form, this A-Z explores the origins and background of participatory design. It looks at the practical methods and techniques you can use in a participatory design project, and at the key roles, principles and issues these projects entail.
It explores topics you might be familiar with and others which might be completely new.

Many of the hints and tips are based on our own experiences of delivering a rich, varied programme of co-design activities as part of the three-year research project, Mobility, Mood and Place. Bringing together architecture and landscape architecture students and older adults, we investigated how we can design environments that are enjoyable to be in, and easy to move around, as we age.

We've combined insights from this work with those of experts from a range of fields - from planning to design, geography to health, sociology to gerontology. Extensively referenced, we hope you will find this handy, practical guide both supportive and inspirational in your future participatory design endeavours.

The Mobility, Mood and Place research team

www.mobilitymoodplace.ac.uk

MOBILITY MOOD PLACE

References & further reading:

• Al-Kodmany, K. (1999). Using visualization techniques for enhancing public participation in planning and design: process, implementation, and evaluation. Landscape and Urban Planning. 45(1), 37–45. • Amason, A. C. et al. (1995). Conflict: an important dimension in successful management teams. Organizational Dynamics. 24(2), 20-35. • Arnstein, S. (1969). A ladder of citizen participation. Journal of the American Institute of Planners. 35(4), 216-224. • Barbour, R. (2007). Doing focus groups. • Bloor, M. (2001). Focus groups in social research. • Brookfield, K. et al. (2013). Engaging residents' groups in planning using focus groups. Proceedings of the ICE - Engineering Sustainability. 166, 61-74. • Bryman, A. (2015). Social research methods. • Buckingham, D. (2012). Creative visual methods in media research: possibilities, problems and proposals. In ed. Hughes, J. Sage Visual Methods. • Carpiano, R. M. (2009). Come take a walk with me: the 'go-along' interview as a novel method for studying the implications of place for health and well-being. Health & Place. 15(1), 263-272. • Catalani, C. & Minkler, M. (2010). Photovoice: a review of the literature in health and public health. Health Education & Behavior, 37(3), 424-451. • Cowden, S. & Singh, G. (2007). The 'user': friend, foe or fetish?: A critical exploration of user involvement in health and social care. Critical Social Policy. 27(1), 5-23. • Cruickshank, L. et al. (2013). Co-design - Fundamental issues and guidelines for designers: beyond the castle case study. Swedish Design Research Journal. 2, 48-72. • Design Council and Technology Strategy Board (n.d). Design methods for developing services. • Dixon-Woods, M. et al. (2005). Synthesising qualitative and quantitative evidence: a review of possible methods. Journal of Health Services Research & Policy. 10(1), 45-53B. • Donnelly Roark, P. (2015) Social justice and deep participation: theory and practice for the 21st century. • Dunn, C. E. (2007) Participatory GIS - a people's GIS? Progress in Human Geography. 31(5), 616-637. • Folger, J. P. et al. (2012) Working through conflict: strategies for relationships, groups, and organizations. • Forrester, J. & Cinderby, S. (2014) A guide to using community mapping and participatory-GIS. • Green, J. & Hart. L. (1999). The impact of context on data. In eds. Kitzinger, J. & Barbour, R. Developing focus group research: politics, theory and practice. • Gregory, J. (2003). Scandinavian approaches to participatory design. International Journal of Engineering Education. 19(1), 62-74. • Halloran, J. et al. (2009). The value of values: resourcing co-design of ubiquitous computing. CoDesign. 5(4), 245-273. • Kanhere, S. S. (2011). Participatory sensing: crowdsourcing data from mobile smartphones in urban spaces. Mobile Data Management (MDM), 2011 12th IEEE International Conference, 6-9 June 2011. • Karssen, A. & Otte, B. (2014). Model making: conceive, create, convince. • Kearney, K. S. & Hyle, A. E. (2012). Drawing out emotions: The use of participant produced drawings in qualitative inquiry. In ed. Hughes, J. SAGE Visual Methods. • Krueger, R. A. & Casey, M. A. (2000). Focus groups: a practical guide for applied research • Krumm, J. (2010). An introduction to Ubiquitous Computing. In ed. Krumm, J. Ubiquitous Computing Fundamentals. • Kusenbach, M. (2003). Street phenomenology: the go-along as ethnographic research tool. Ethnography. 4(3), 455-485. • Lee, Y. (2008). Design participation tactics: the challenges and new roles for designers in the co-design process. CoDesign. 4(1), 31-50. • Local Government Improvement and Development (2010). Integrating community engagement and service delivery: pointers to good practice. • Luck, R. (2007). Learning to talk to users in participatory design situations. Design Studies, 28(3), 217-242. • Patrick, J. H. et al. (1998). Recruiting research participants: a comparison of the costs and effectiveness of five recruitment strategies. The Gerontologist. 38(3), 295-302. • Pope, C. et al. (2000). Analysing qualitative data. BMJ. 320(7227), 114-116. • Pope, C. et al. (2007). Synthesising qualitative and quantitative health evidence: a guide to methods. • Preiser, W. (2001). Feedback, feedforward and control: post-occupancy evaluation to the rescue. Building Research & Information, 29(6), 456-459. • Rambaldi, G. et al. (2006). Mapping for change: practice, technologies and communication. Participatory Learning and Action. 54, 1-1.3 • Royal Town Planning Institute (2007) Guidelines on effective community involvement and consultation - RTPI Good Practice Note 1. • Sanders, E. B. N. & Stappers, P. J. (2008). Co-creation and the new landscapes of design. CoDesign. 4(1), 5-18. • Simonsen, J. & Robertson, T. (2012). Routledge international handbook of participatory design. • Soteri-Proctor, A. (2011). Little Big Societies: Micro - mapping of organisations operating below the radar. • Sutton, T. et al. (2009). A gentle introduction to GIS. • Van den Hove, S. (2006). Between consensus and compromise: acknowledging the negotiation dimension in participatory approaches. Land Use Policy. 23(1), 10-17. • Wallace, C. & Pichler, F. (2009). More participation, happier society? A comparative study of civil society and the quality of life. Social Indicators Research. 93(2), 255-274. • Wang, C. & Burris, M. A. (1997). Photovoice: concept, methodology, and use for participatory needs assessment. Health Education & Behavior. 24(3), 369-387. • Yancey, A. K., et al. (2006). Effective recruitment and retention of minority research participants. Annual Review of Public Health 27(1), 1-28. • Zeisel, J. (2006). Inquiry by Design.

To cite this document:
Mobility, Mood and Place (2016)
The A-Z of Co-Design:
A brief introduction to participatory design

Lifelong Health & Wellbeing – Research for Healthy Ageing
EPSRC Engineering and Physical Sciences Research Council
The University of Edinburgh · Heriot-Watt University · King's College London · University of York

ANIMATE

Facilitators are critical to participatory design. They plan, structure, drive and animate activities, creating opportunities for users to become engaged design decision-makers. Importantly, a facilitator's behaviour can, consciously or otherwise, inform a participant's ability to engage. Luck (2007) has highlighted the significance of a facilitator's spoken behaviour, finding that user engagement is supported by clear explanations, unambiguous terminology, asking general questions that relate to users' experiences, a familiar conversational tone, a natural conservational style, humour and responding to users' design suggestions.

Further reading: Luck, R. (2007). Learning to talk to users in participatory design situations. Design Studies. 28(3), 217-242.

BUILD

Model-making is a creative, visual method of communication. Compared to verbal methods, such as interviews and focus groups, it may help co-design participants present their ideas more directly with less interference from the co-design facilitator (Buckingham, 2012). Physical models can allow "the complex or ambiguous to be made simple and straightforward", fostering collaboration through the swift communication and understanding of ideas (Design Council and Technology Strategy Board, [n.d]). The technique works best when facilitators have had some training in model-making while the choice of materials is crucial, as participants need to work safely, quickly and effectively. Good options include plasticine and building blocks.

Further reading: Karssen, A. and Otte, B. (2014). Model making: conceive, create, convince.

CHOOSE

Users should be able to choose how they wish to participate in a co-design exercise from a range of options set out by the facilitator (Cruickshank et al. 2013). Diverse participation techniques will, of course, produce diverse data / outputs which can be summarised and combined to formulate ideas in many ways (Dixon-Woods et al. 2005). Involving the selection, recording, and ordering of information, and the use of words and text, Narrative Synthesis (NS) - or Narrative Summary - is a less formal method of bringing data / outputs together and is useful for combining particularly varied data. Its form can vary from a simple description of the data, to a more interpretive account that incorporates commentary (Pope et al., 2007)

Further reading: Pope, C. et al. (2007). Synthesising qualitative and quantitative health evidence: a guide to methods.

DRAW

Drawing can be a useful way of investigating ideas quickly, as well as an effective mechanism for accessing a participant's understanding of their world (Kearney and Hyle, 2012). Popular drawing types include mapping, diagramming and sketching; activities inevitably require good drawing implements and paper. Bear in mind individuals' differing abilities and interests when deciding whether drawing is appropriate in co-design. For example, drawing activities might be more successful for people who are visually, as opposed to verbally, orientated. And it's important to remember that for various reasons, from visual impairments to lack of confidence, some individuals may be less willing or able to participate in a drawing activity.

Further reading: Al-Kodmany, K. (1999). Using visualization techniques for enhancing public participation in planning and design: process, implementation, and evaluation. Landscape and Urban Planning 45(1), 37–45.

ENGAGE

An inclusive society is one with ample opportunities for many different kinds of people to engage in important public decisions. There are many different ways in which participation can be facilitated. Nearly half a century ago, Sherry Arnstein (1969) sought to distinguish and rank different approaches to participation through the concept of a 'ladder of citizen participation'. The ladder consisted of eight 'rungs', each relating to a different form of 'participation', with the degree of citizen control over decisions increasing the higher up the ladder you went. Although encountering criticism over the decades, Arnstein's model has continued to foster helpful conversations about who gets to engage, in what ways, with whom, to what end, and at what stage in the decision-making process. These conversations should inform facilitators' decisions on the kind of engagement techniques to employ in a participatory design project.

Further reading: Arnstein, S. (1969). A ladder of citizen participation. Journal of the American Institute of Planners. 35(4), 216-224.

FEEDBACK AND FEEDFORWARD

In a design project, feedback is where outcomes inform modifications to earlier stages of the design process. Benefitting from the inclusion of people with different points of view and varying areas of expertise, co-design involves continuous appraisal of this type, and reformulation of the task domain. Feedback is less risky, but less efficient, than feedforward, which involves an assessment of what's been produced so far, with guidance on how to make it better. It's a formative type of feedback that occurs early on or throughout the process. Both feedback and feedforward are essential in participatory design.

Further reading: Preiser, W.F. (2001). Feedback, feedforward and control: post-occupancy evaluation to the rescue. Building Research & Information. 29(6), 456-459.

GIS

A Geographic Information System (GIS) is a tool used to store, analyse and visualise spatial information so as to determine patterns and relationships that can inform decision making (Sutton et al., 2009). Spatial data for GIS is commonly collected from historical paper maps and satellites, and combined with measurements collected from questionnaires and sensors. The power of using a GIS is that it combines multiple layers of spatially and temporally indexed information to build a rich picture of the environment and deepen our understanding of geographically-determined phenomena, e.g. health. To widen access to the method, a form of 'participatory GIS' (PGIS) has been developed which is "context- and issue-driven rather than technology-led and seek(s) to emphasize community involvement in the production and/or use of geographical information" (Dunn, 2007: 616).

Further reading: Dunn, C. E. (2007). Participatory GIS - a people's GIS? Progress in Human Geography. 31(5), 616-637.

HARMONY

Because participatory design processes typically encompass a plurality of views, conflict and compromise - rather than harmony and consensus - are pretty much inevitable (van den Hove, 2006). Surprisingly, perhaps, certain types of conflict can be a valuable resource in design and should be supported (Gregory, 2003). Whereas 'bad' conflict can lead to hostility, distrust, cynicism, and apathy (Amason et al. 1995), 'good' conflict can lead to the identification of new possibilities, innovation and the questioning of assumptions, resulting in better quality, more robust decisions (Gregory, 2003). In group settings, 'bad' conflict tends to relate to personalised, individually-oriented disagreements, while 'good' conflict relates to substantive, issue-related differences of opinion (Amason et al. 1995). Facilitators are critical in managing conflict. To encourage the good and avoid the bad, they should strive to elicit people's opinions in such a way that others don't feel attacked (Amason et al. 1995).

Further reading: Folger, J. P. et al. (2012). Working through conflict: strategies for relationships, groups, and organizations.

INCLUDE

Participatory design processes should be accessible to all users. To move beyond the 'usual suspects', it's vital to use strategies that are inclusive of individuals or groups who may be marginalised, such as low-income groups. In the first instance, you need to think about the effective communication of opportunities to participate, taking into account the needs of people with different abilities and the opportunities offered via different socio-cultural networks. For example, ICT can help, but don't assume that everyone has access to the internet. The timing, design and location of co-design activities should take into account people's differing needs and resources (social, financial etc.) and their varied patterns of daily life. Importantly, securing the involvement of a range of users is not the same as securing the involvement of a representative set of users. Indeed, the latter may not be an appropriate or possible goal in participatory design, since the number of participants tends to be relatively small.

Further reading: Royal Town Planning Institute (RTPI) (2007). Guidelines on effective community involvement and consultation -RTPI Good Practice Note 1.

JUST

It's important that all kinds of stakeholders have real opportunities to discuss and influence important public decisions. The outcomes of such decisions are more likely to be socially just if there is a healthy diversity of perspectives represented. Co-designed public spaces are more likely to be socially inclusive and to foster social mixing by meeting the needs and preferences of multiple kinds of users, for example.

Further reading: Donnelly Roark, P. (2015). Social justice and deep participation: theory and practice for the 21st century.

KEN

Ken is a Scottish word meaning 'to know'. Participatory design is premised on the notion that users hold different knowledges and experiences and better outcomes result when these are integrated into the decision-making process. Users can also hold different values and, since values capture the ideas and qualities that people deem particularly important, decisions that connect to users' values may be more successful than those which do not (Halloran et al. 2009, 245). Users' values should be considered a positive resource in the design process. They tend to emerge as participants discuss, disagree over, and develop ideas. Representing values in evolving designs can lead to reflection and, potentially, value development and/or change. This can support the generation of novel and creative ideas (Halloran et al. 2009).

Further reading: Halloran, J. et al. (2009). The value of values: resourcing co-design of ubiquitous computing. CoDesign. 5(4), 245-273.

LOCATE

Participatory design must be sensitively located, observing users' particular cultural and social norms and values, which may differ from those of the facilitator. When selecting settings for participatory activities, venue choice can inform who decides or is able to take part, and the type of participation achieved (Bloor, 2001). Researchers have found, for example, that when engaging school children in group discussions, the formality of the discussion varied according to the formality of the discussion setting (Green and Hart, 1999).

Further reading: Green, J. and Hart. L. (1999). The impact of context on data. In eds. Kitzinger, J. and Barbour, R. Developing focus group research: politics, theory and practice.

MAP

Community mapping entails the production of a spatial map in collaboration with members of a community, often through reference to local knowledge and resources (Rambaldi et al., 2006). Taking into account diverse information, community maps may be constructed using multiple tools and techniques, from simple paper and pens, through touch screens, to online mapping or GIS (Geographic Information System). The process of creating and negotiating the map content is as important as the finished map. Mapping exercises can help reveal how communities interpret, value and relate to a place. Although potentially positive and empowering, community maps can sometimes act to affirm/reaffirm the position of powerful interests and/or to exclude certain groups (Rambaldi et al., 2006).

Further reading: Forrester, J. and Cinderby, S. (2014). A guide to using community mapping and participatory-GIS.

NETWORK

Tapping into existing networks and groups can be a time-saving way to identify and involve users in participatory design activities (Brookfield et al. 2013). It's important to remember, though, that by focusing on established structures and organisations, it's easy to miss people who tend not to participate, and groups which exist 'under the radar'. Research into 'under the radar' community groups in England found, for example, some 58 such groups/activities operating in just 11 streets (Soteri-Proctor, 2011). Large numbers of 'missed' users can lead to a 'skewed' set of people with which to engage which, in turn, may result in 'skewed' outputs.

Further reading: Patrick, J. H. et al. (1998). Recruiting research participants: a comparison of the costs and effectiveness of five recruitment strategies. The Gerontologist. 38(3), 295-302.

ONE-TO-ONE

Participatory design activities may involve one-to-one engagement with users and/or engagement in small and large groups. Within groups, the group composition and dynamics inform what, and how, issues and experiences are discussed. Group settings can, for example, encourage users to build on one other's ideas (Krueger and Casey, 2000), potentially leading to novel suggestions. But, less positively, real or perceived peer pressure, power dynamics, dominant individuals and familiarity with other participants might act to limit participants' contributions (Barbour, 2007). Engaging on a one-to-one basis allows you to explore individuals' issues, views and experiences free from the influence of group effects, both positive and negative.

Further reading: Bryman, A. (2015). Social research methods.

PHOTOVOICE

Photovoice is a community-based, participatory research method valued for uncovering rich, first-person descriptive information (Catalani and Minkler, 2010). Suited to participatory design's interest in understanding users' experiences, it involves community members using photography to record some aspect of their life, such as the assets and needs of their locality, or the factors which constitute their lived reality. The method allows often-excluded groups, such as people who cannot read or write, to participate (Wang and Burris, 1997). Typically, individuals are provided with cameras and some training in photography. The photographs and their meanings are discussed and critically reflected upon in one-to-one conversations and/or in small and large groups. In some projects, the photographs - and the issues they raise - are presented to the wider public and/or policymakers through exhibitions, talks etc.

Further reading: Catalani, C. and Minkler, M. (2010). Photovoice: a review of the literature in health and public health. Health Education & Behavior, 37(3), 424-451.

QUANTITY

Participatory design can produce huge amounts of information of variable types and quality. Preparing, ordering, sifting through and interpreting large quantities of information can be complicated, labour intensive and time consuming (Pope et al. 2000). Time should be spent developing an appropriate information management plan before any design activities begin, while developing a clear set of questions to 'ask' of the collected information can help guide and streamline the review and analysis process.

Further reading: Pope, C. et al. (2000). Analysing qualitative data. BMJ. 320(7227), 114-116.

REPEAT

Repetition is critical for improving participatory design processes and protocols. Learning-by-doing can lead to big improvements in practice in a short space of time (Luck 2007). Matters such as the duration of any participatory activity, plus its content, location, size and the necessary number of facilitators, can all be honed through repetition. Repeating the same activity with another set of users is likely, however, to produce different outcomes since all users are different.

Further reading: Bryman, A. (2015). Social research methods.

SURVEY

Survey information collected on, and from, people, places, services and products can usefully inform design decisions. In terms of places, items like architectural style and quality, building form, land uses (residential, retail etc.), building condition, noise, light and use (e.g. footfall) can all be surveyed while, in terms of people, behaviours, preferences, attitudes, views and experiences can be surveyed. How, when, where and what to survey are key issues requiring careful consideration.

Further reading: Zeisel, J. (2006). Inquiry by Design.

TRANSFORM

Co-design involves or enables transformation in various domains, including a transformed quality of design, a transformed appreciation of the user on the part of the facilitator, who may be a design professional, a transformative experience of empowerment and creativity for the participant, and a transformed way of working. On this latter point, co-design requires the creation of non-hierarchical situations where power is ceded from facilitators to participants. Though challenging, this can lead to the generation of new and exciting ideas and design directions.

Further reading: Lee, Y. (2008). Design participation tactics: the challenges and new roles for designers in the co-design process. CoDesign. 4(1), 31-50

UTILISE

Many different techniques, tools and materials can be utilised within, and to facilitate, participatory design. The rapid expansion in small, portable networked devices, such as smartphones - and the introduction of computers into many of the commonplace devices we own and use (Krumm 2010), creates new and convenient instruments for participatory design. Individuals can, for example, use the camera function on their mobile phones to create a visual record of their community's assets and needs (see Photovoice) or use the GPS function on their smartphones to identify an area's most and least frequently used areas of greenspace (see Map). This information can help build up a rich, detailed picture of users' views and experiences. However, too great a reliance on such technologies may result in the exclusion of often marginalised groups, such as older adults, who may be less likely to own or use smartphones, social media etc.

Further reading: Kanhere, S. S. (2011). Participatory sensing: crowd-sourcing data from mobile smartphones in urban spaces. Mobile Data Management, 2011 12th IEEE International Conference, 6-9 June 2011.

VALUE

Participatory design is often an enjoyable, interesting, and meaningful activity in itself, not just a prelude to action, and it's important to appreciate its 'intrinsic value'. This is not, however, to suggest that we shouldn't also care about the instrumental effectiveness of participatory design. If a design process is enjoyable and interestingly challenging in its own right, it is likely to produce useful and persuasive outcomes (e.g. plans, products). Conversely, participants are more likely to remember the co-design process as a valuable one if they can see the influence that their discussions have had over medium-term and longer-term actions, policies, and outcomes.

Further reading: Wallace, C. and Pichler, F. (2009). More participation, happier society? A comparative study of civil society and the quality of life. Social Indicators Research. 93(2), 255-274.

WALK

Walking interviews, or 'go-alongs', are conducted on the move and combine participant observation with interviewing (Carpiano 2009). They allow for richer and potentially more meaningful accounts of perceptions of the environment (Kusenbach 2003) making them particularly useful for place-based design projects. Further, by enabling the researcher to join the participant 'in place', these interviews support a deeper understanding of the participant's subjective experience of the body in motion.

Further reading: Carpiano, R. M. (2009). Come take a walk with me: the 'go-along' interview as a novel method for studying the implications of place for health and well-being. Health & Place. 15(1), 263-272.

XPERIENCE

The nature and quality of users' experiences within a participatory design process will inform the type of participation achieved and, where relevant, users' ongoing engagement with the process. Factors which may help enhance the experience for users, and maintain their participation, include a welcoming, open, inclusive and supportive setting, refreshments, on-site childcare, a convenient time, compensation of expenses, help with transport, the provision of incentives (e.g. a retail voucher), opportunities to provide information in private, facilitators communicating their appreciation to users for their participation, assurances of anonymity and confidentiality, and maintaining contact with users outside scheduled events (Yancey et al. 2006).

Further reading: Yancey, A. K., et al. (2006). Effective recruitment and retention of minority research participants. Annual Review of Public Health. 27(1), 1-28.

YES

Multiple international, national and local organisations have said 'yes' to the practice of involving users in decision making. Since the 1992 Rio Declaration which, through Principle 10, called for the "participation of all concerned citizens" in addressing "environmental issues", institutional interest in participation has grown hugely (van den Hove, 2006). In the UK, the Government recently introduced a raft of 'community rights' intended to provide new opportunities for citizens to actively design and deliver policies and services while, for many years, the National Health Service and social care providers have sought to involve users in service development (Cowden and Singh, 2007).

Further reading: Local Government Improvement and Development (2010). Integrating community engagement and service delivery: pointers to good practice.

ZEITGEIST

Involving users in the design process may seem like a contemporary concern but the practice has a long history (Sanders and Stappers, 2008). Key to its early development in the 1970s were Scandinavian workplace democracy projects which saw users, trade unions, designers and other stakeholders participate in the development of workplace systems. These projects, and thus early participatory design, were concerned with designing information systems that would allow individuals to change and develop their work practices to incorporate the use of computers and better working conditions (Simonsen and Robertson, 2012). Since then, involving users in decision making has become an established approach in diverse areas including health, urban planning and social care.

Further reading: Simonsen, J. and Robertson, T. (Eds.) (2012). Routledge international handbook of participatory design.